

**DRAFT SAFE HARBOR AGREEMENT AND HABITAT MANAGEMENT PLAN FOR  
KOLOA (HAWAIIAN DUCK) AND NĒNĒ (HAWAIIAN GOOSE)  
ON UMIKOA RANCH, ISLAND OF HAWAI‘I**

This Safe Harbor Agreement (“Agreement”) is made and entered into as of the day of \_\_\_\_\_, 2001, by and among FUJITORY HAWAII, INC, DBA UMIKOA RANCH / OMAOMAO CORPORATION (“UMIKOA RANCH”), the U.S. FISH AND WILDLIFE SERVICE (“USFWS”) and the STATE OF HAWAII, DEPARTMENT OF LAND AND NATURAL RESOURCES (“DLNR”), by its Board of Land and Natural Resources, hereinafter collectively called the “Parties.”

## **1. INTRODUCTION**

This Agreement has been developed under the Fish and Wildlife Service’s Safe Harbor Policy (64 FR 32717) and in accordance with the State of Hawaii, Department of Land and Natural Resources (Hawaii Revised Statutes (HRS) §195D-22). The Safe Harbor Policy was developed to encourage private and other non-Federal property owners to voluntarily undertake management activities on their property to enhance, restore, or maintain habitat to benefit Federally-listed species. Under this policy, property owners who undertake management activities that attract listed species onto their properties, or into areas affected by actions undertaken on their property, or that increase the numbers or distribution of listed species already present on their properties, will not incur future property-use restrictions. Safe Harbor Agreements provide assurances to the property owner that allow alterations or modifications to enrolled property, even if such action results in the incidental take of a listed species or, in the future, returns the species back to an originally agreed-upon baseline condition (i.e., species population estimates and distribution and/or characteristics and determined area of the enrolled property that sustain seasonal or permanent use of the covered species at the time the Agreement is executed).

Through the development of a Safe Harbor Agreement, the USFWS, DLNR, and UMIKOA RANCH desire to work together toward the creation and enhancement of habitat for koloa or Hawaiian duck (*Anas wyvilliana*) and nēnē or Hawaiian goose (*Branta sandvicensis*) on privately owned lands in the Hamakua District of the island of Hawaii (Hawai‘i). The activities implemented under this Agreement will aid in reestablishment of wild populations of koloa and nēnē in the Hamakua District of Hawai‘i, increasing the current range of both species, restoring the species to part of their historic ranges, and increasing the total statewide population of both species, thus contributing to the recovery of these endangered species.

In 1998, UMIKOA RANCH agreed to enter into a partnership with the U.S. Department of Agriculture’s (USDA) Natural Resources Conservation Service (NRCS) and Ducks Unlimited Incorporated through the NRCS’ Wetland Reserve Program (WRP). The WRP provides incentives for landowners to restore and protect agricultural wetlands for the benefit of endangered wildlife. Under the partnership, UMIKOA RANCH agreed to restore wetland and associated riparian and upland habitat designed for koloa and nēnē. The agreement includes activities to restore hydrologic function to degraded wetland areas, create additional wetland

habitat, protect surrounding upland forests and pastures, and monitor bird and plant response to these activities.

## **2. SPECIES BACKGROUND**

The fossil record indicates that historically at least 10 species of ducks and geese in the family Anatidae were endemic to the Hawaiian Islands (Olson and James 1991). Of these only the nēnē, koloa, and the Laysan duck (*Anas laysanensis*) have survived in the Hawaiian Islands to the present time. The Laysan duck, once distributed throughout the state, is currently restricted to the Northwestern Hawaiian Island of Laysan and only the koloa and nēnē are found on the main Hawaiian Islands. At the time of the arrival of Captain Cook in 1778, koloa were distributed in large numbers on all of the main Hawaiian Islands except Lanai and Kahoolawe (USFWS 1999a). Historic declines of both nēnē and koloa are attributed to habitat alteration, introduction of mammalian predators such as rats (*Rattus* spp.), dogs (*Canis familiaris*), cats (*Felis domesticus*), mongooses (*Herpestes auropunctatus*) and pigs (*Sus scrofa*) and over hunting. By the 1950's all three species were supported by so few individuals that they were on the brink of extinction (Schwartz and Schwartz 1953, Smith 1952, USFWS 1982, USFWS 1999a). Over the past 40 years, the captive propagation and reintroduction of nēnē and koloa have increased numbers of each species in the wild. Detailed species accounts for koloa and nēnē are provided in Appendices B and C, respectively.

## **3. IMPORTANCE OF PRIVATE LANDS**

Unlike endangered forest birds in the Hawaiian Islands, which are usually restricted to remote forested habitats that are often under state or federal jurisdiction, the koloa and nēnē are highly mobile and utilize a geographically and biologically diverse range of habitats. In addition, few endangered birds in the Hawaiian Islands will recover solely on public land and nēnē and koloa are no exception. Of the Hawai'i's 2,573,400 acres, less than 10% are under federal jurisdiction, and only 14% are protected by conservation management. The core area for koloa on Hawai'i is approximately 260,000 acres (Giffin 1983), of which nearly 50 percent is privately owned (Juvik and Juvik 1999).

Nēnē routinely travel between open grassland areas that are privately owned. Very little nēnē habitat is on lands under the jurisdiction of government conservation agencies; in fact, the majority of good nēnē habitat is on private lands that are used for cattle grazing. Experience indicates that these grazed pastures are excellent for nēnē because cattle grazing stimulates the production of new grass shoots, which are favored nēnē food; water is available in stock ponds or mechanical water units; and feral dogs are often controlled as part of normal ranch operations (C. Terry, Hawai'i DOFAW, pers. comm. 1999).

As noted above, the availability of private land to nēnē and koloa is therefore an important aspect of their recovery. Therefore, a significant aid to the recovery of these species is the development of a Safe Harbor Agreement under section 10(a)(1)(A) of the Federal Endangered Species Act (ESA) and §195D-22 of the Hawai'i Revised Statutes (HRS) that encourages the assistance of

private landowners in the recovery of threatened and endangered species, in return for protection, a "safe harbor," from any additional regulatory requirements under the State and Federal endangered species laws. This Safe Harbor Agreement will assist in the recovery of koloa and nēnē in Hawai‘i by permitting UMIKOA RANCH to encourage the species’ use of the lands enrolled under the Agreement without additional regulatory burden.

#### **4. PURPOSE OF AGREEMENT**

The purpose of this Agreement is to facilitate the creation and enhancement of habitat for koloa and nēnē on portions of UMIKOA RANCH on the island of Hawai‘i and promote the conservation of other endangered and threatened species that currently exist on the enrolled lands by: (a) recognizing the voluntary management actions that UMIKOA RANCH is implementing or is prepared to implement for the benefit of the koloa and nēnē; (b) providing assurances to UMIKOA RANCH that the USFWS and DLNR will not require additional management actions; (c) establishing the baseline conditions on the enrolled lands; and, (d) providing assurances to UMIKOA RANCH that, as long as the baseline conditions are maintained, all other lawful land-use activities may proceed on the enrolled lands even if such activities may result in the incidental take of the koloa and nēnē.

When signed, this Agreement will serve as the basis for the USFWS and DLNR to issue permits under section 10(a)(1)(A) of the ESA and under §195D-22 of the HRS for the incidental take of nēnē and koloa. The issuance of this permit will not preclude the need for UMIKOA RANCH to abide by all other applicable Federal, State, and local laws and regulations that may apply.

#### **5. DESCRIPTION OF COVERED LAND**

Enrolled lands are the lands owned by or otherwise controlled by UMIKOA RANCH on the island of Hawai‘i (TMK 3:4-1-06-6). UMIKOA RANCH is located 25 miles northwest of Hilo on the Hamakua Coast. The property is wedged between State lands to the west, Kamehameha Schools property to the east, and small private ranches below Mana Road to the south. The entire parcel is zoned for agriculture. Operations on UMIKOA RANCH include koa (*Acacia koa*) reforestation, cattle ranching, selective timber harvesting, wetland habitat and native plant restoration, community education and outreach, and ecotourism. (Appendix A, Figure 2. Map of Umikoa Ranch and Aerial Photos)

UMIKOA RANCH covers 2,000 acres and ranges in elevation from approximately 2,200 to 5,380 feet with an annual average rainfall of 80 to 130 inches per year. The lower portion of UMIKOA RANCH (~2200 to 4000 feet elevation) can be characterized as grazed, open canopy ‘ohi‘a/hapu‘u (*Metrosideros/Cibotium*) montane wet forest. A few residential and operational structures are located at the lower end of the property. The middle portion (~4,000 to 4,600 feet elevation) is dominated by 500-acres of koa that was manually planted in 1991. The upper portion (~4600 to 5380 feet elevation), once a mature koa forest with native plant understory, has been degraded by more than a century of cattle grazing. The upper portion currently consists primarily of montane wet kikuyu pasture with remnants of koa, ‘ohi‘a, naio (*Myoporum*

*sandvicensis*), and hapu‘u. An active mill used to process salvaged koa wood is located in this area.

In 1998, approximately 150 acres of pasture in the upper portion were scarified to promote koa regeneration and currently contain two-year-old koa. The remaining 700 acres, most of which are in pasture for cattle in the upper portion of UMIKOA RANCH, will be managed in increments of approximately 150 acres to re-establish a koa forest (see Section 7. Management Actions for Covered Species). Each 150-acre unit is fenced and gated to exclude cattle during sapling stages and to facilitate intermittent grazing to reduce understory growth as koa trees mature.

Numerous ephemeral and intermittent tributaries feed the Ka‘ala Stream system on the northwestern boundary of UMIKOA RANCH. Several stock ponds were constructed in depressional areas to take advantage of the surface hydrology. Stock ponds are water-retention basins constructed for livestock and are generally beneficial to waterfowl and other wildlife. The deeper gulches contain plunge pools that hold water intermittently to year round. Stream banks are heavily vegetated with trees, ferns and pasture grasses. Plunge pools are potholes of calm water in the rocky streambed that vary widely in size, shape, and permanence. Both stock pond and plunge pool areas provide habitat for aquatic invertebrates and plants, and food resources and cover for koloa.

## **6. BASELINE DETERMINATION**

The baselines for koloa and nēnē have been determined by monthly biological surveys conducted by Ducks Unlimited between January and October 2000. The baseline for koloa is represented by the number of acres of permanent and semi-permanent wetland habitat (in the form of stock ponds) that currently exists on UMIKOA RANCH premises and the number of individuals known to use the habitat. This habitat includes the acreage of open water plus the adjacent and surrounding uplands (equal to five times the water area). Currently, there are five existing ponds, ranging from 0.12 to 0.30 acres, providing approximately one acre of open water and five acres of adjacent upland habitat. Evidence indicates occasional use of the habitat described above by one pair of koloa. Therefore, the baseline for koloa is two individuals, and one acre of open water habitat and five acres of adjacent upland habitat.

The baseline for nēnē is the number of individuals that occur on the property, which is zero.

## **7. MANAGEMENT ACTIONS FOR COVERED SPECIES**

This Agreement provides for creation and enhancement of habitat for koloa and nēnē and control of predators on approximately 1,000 acres located on the upper portion of UMIKOA RANCH.

### **7.1** *Creation and enhancement of approximately 2 acres of palustrine emergent marsh and 150 acres of riparian and associated uplands for nēnē and koloa.*

The created and enhanced wetland areas are positioned on the landscape in three cluster areas to supplement existing wetlands and waterways. Cluster 1 will contain three wetlands (water surface area of 0.19 acres) with riparian habitat and associated uplands (4.1 acres) fenced for cattle exclusion. Cluster 2 will contain two wetlands (water surface area of 0.45 acres) with riparian habitat and uplands (approximately 133 acres) fenced for cattle exclusion. Cluster 3 will contain five wetlands (water surface area of 1.3 acres) with riparian habitat and uplands (14.4 acres) fenced for cattle exclusion. The ponds will fill and be maintained through natural hydrology and rainfall patterns. Fenced areas are expected to exclude ungulates and dogs, thereby providing protected habitat and maintaining the stability of each wetland. The presence of cattle within fenced areas will be minimized to reduce the introduction of fecal matter into newly created wetlands. However, carefully managed cattle may be used to graze vegetation within the fenced areas in order to maintain habitat for koloa and nēnē. Restoration of wetland areas is supported by the NRCS WRP, a North American Wetlands Conservation Act (NAWCA) grant, and technical assistance from NRCS and Ducks Unlimited.

## **7.2**     *Removal of predators and non-native birds*

Koloa and nēnē are extremely vulnerable to mammalian predators such as mongoose, cats, dogs, and rats. An active predator control program will be implemented to reduce the number of mammalian predators on UMIKOA RANCH. Traps and bait stations will be placed within fenced areas of the newly restored habitat where koloa and nēnē are likely to occur. A “shoot-on-sight” policy will also be implemented to eliminate the threat posed by feral dogs. Feral pigs will be controlled in pond and other areas where they may impact nene and koloa production and survival. UMIKOA RANCH will prevent the introduction and establishment of non-native waterfowl by agreeing to remove any non-native (both feral and non-migratory) waterfowl. UMIKOA RANCH will implement predator and non-native waterfowl control operations with the technical assistance of USFWS and DLNR.

## **7.3**     *Koa reforestation and watershed protection*

The following management practices for koa reforestation will be implemented in 150-acre units on the upper portion of UMIKOA RANCH: 1) each unit will be fenced to exclude cattle; 2) all unhealthy or senescent koa trees will be harvested and milled; 3) heavy machinery will be used to scarify (expose) soil below kikuyu mats to promote germination of the existing koa seed bank; 4) herbicide (Fusilade) will be applied to control kikuyu grass until koa reaches sapling stage; 5) if necessary, areas that show poor koa re-establishment may be planted with nursery propagated seedlings; and 6) controlled grazing to reduce alien grasses in the understory as koa trees mature. Koa restoration activities will reforest degraded pasture, increase soil-water retention capacity, and provide nesting and foraging habitat for Hawaiian forest birds. UMIKOA RANCH will implement fencing, scarification, and subsequent management through the State of Hawai‘i Forest Stewardship Program. UMIKOA RANCH will contribute fencing materials and labor for riparian and upland restoration actions and will be responsible for managing their project lands to support breeding koloa and nēnē in accordance with the conservation practices developed under cooperation with the NRCS and Ducks Unlimited.

#### 7.4 *Other habitat enhancement activities*

Created and enhanced wetland and associated riparian and upland areas will be managed for the establishment of plants that support the diet of koloa and nēnē, and to promote aquatic fauna that are a part of koloa diet (Appendix B, Koloa Species Account and Appendix C, Nēnē Species Account). Wetland and associated riparian and upland areas, koa reforestation units, and remaining pasture land will be managed to prevent establishment of invasive alien species such as, but not limited to kikuyu grass (in wetland and riparian zones), gorse (*Ulex europaeus*), and banana poka (*Passiflora molissima*). Newly created wetland habitats will be monitored for the presence of mosquito (*Culex quinquefasciatus*) larvae. UMIKOA RANCH, with the assistance of a biological monitor (Ducks Unlimited or USFWS), will monitor the establishment of biotic components on UMIKOA RANCH property to determine necessary management actions to accomplish the habitat enhancement activities mentioned above.

### 8. NET CONSERVATION BENEFIT

“Net Conservation Benefit” means that the cumulative benefits of the management activities identified in the Agreement provide for an increase in the covered species’ population and/or the enhancement, restoration, or maintenance of the covered species’ habitat within the enrolled property for the term of the Agreement. The net conservation benefit must be sufficient to directly or indirectly contribute to recovery of the covered species.

The *Draft Revised Recovery Plan for Hawaiian Waterbirds* (USFWS 1999a) identifies the major threats to koloa as hybridization with feral mallards, damage to nesting habitat by feral ungulates, habitat loss, hunting, and alteration of suitable habitat by invasive vegetation. The *Revised Recovery Plan for Nēnē or Hawaiian Goose (Branta sanvicensis)* (USFWS 1999b) lists inadequate nutrition, genetic homogeneity, human-caused disturbance and mortality, behavioral issues associated with small population size and the captive breeding process, and disease as the major reasons for decline of nēnē. Both koloa and nēnē are also extremely vulnerable to mammalian predators.

Conservation benefits for koloa and nēnē from implementation of this Agreement are expected in the form of creation and enhancement of open water and associated upland habitat intended to contribute to an increase and establishment of koloa and nēnē populations in mid- to upper-elevations of the Kohala-Mauna Kea Region of the Big Island. The fenced units supported by the NRCS Wetland Reserve Program and State Forest Stewardship Program, will exclude cattle from new wetland habitat and provide safe nesting sites for nēnē and koloa. Rehabilitated koa stands are expected to enhance hydrologic functions of the watershed. A mature koa canopy is anticipated to expand foraging and nesting habitat for other endangered and threatened birds that occur on the enrolled lands, and create an open understory for colonization or outplanting of native plants. It is expected that the koloa and nēnē will successfully reproduce and establish new or expand core populations for each species on the island of Hawaii.

Under this Agreement, koloa and nēnē habitat will be protected and enhanced by protecting specific habitats from cattle and feral ungulates, reducing mammalian predators in and around

fenced areas, restricting hunting, planting of native species in managed areas, and removing invasive vegetation. It is expected that the provision of mid- to upper-elevation habitat will reduce the likelihood of hybridization of koloa with feral mallards and help to maintain the genetic integrity of koloa on the island of Hawaii.

It is anticipated that five pairs of koloa and ten pairs of nēnē will become established on UMIKOA RANCH in the next 20 years. Koloa are expected to begin reproducing two to three years after restoration is completed. Nēnē reproduction is expected to occur within five years after first becoming established on UMIKOA RANCH premises. It is expected that entering into this Agreement for a period of 20 years will allow sufficient time for the koloa and nēnē to establish self-sustaining breeding populations within the enrolled lands. The recovery of both species will be enhanced by the expected increase in the number of wild birds that may also provide an opportunity to increase genetic diversity for each species.

In summary, the benefits to koloa and nēnē from conservation measures under the Agreement are increases in range and population of both species through creation and enhancement of suitable habitat, and management and protection to reduce threats. It will also provide an example of a mutually beneficial relationship between government agencies and a private landowner to the benefit of endangered species.

## **9. LEVEL OF INCIDENTAL TAKE ANTICIPATED**

Upon issuance of permits under section 10(a)(1)(A) of the ESA and section 195D-22 of the HRS, UMIKOA RANCH may incidentally take koloa and nēnē on the enrolled property, so long as the baseline conditions applicable to the property are maintained and the terms of this Agreement are implemented. Incidental taking means any taking otherwise prohibited, if such taking is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity (50 CFR 17.3).

UMIKOA RANCH may continue current land use practices, undertake new ones, or make any other lawful use of the property, even if such use incidentally results in the loss of nēnē or koloa or their habitat covered under this Agreement. Among the activities UMIKOA RANCH plans to continue, which in no way shall be considered a limitation on any other activity UMIKOA RANCH desires to engage in, are the following activities that may result in an unintentional, incidental take of koloa or nēnē: 1) koa forestry, 2) eco-tourism, 3) cultivation of agricultural crops, and 4) cattle grazing.

Incidental take could occur as a result of grazing practices where cattle damage or disturb koloa or nēnē nests outside of fenced areas. Take could also result from reforestation-related activities such as equipment operation or pulse grazing. However, these impacts are expected to be sporadic and limited in nature.

In assessing the impact of the authorized incidental taking, it is important to emphasize that the only open water and associated upland habitat that will be authorized to be eliminated is the amount of habitat that would not exist but for the voluntary participation by the landowner in the

“safe harbor” program described in this Agreement. Alternatively, this Agreement does not allow habitat that existed when the parties entered into this Agreement to be impacted. Thus, the impact of the incidental taking authorized under this program is at the most, a return to the current or baseline conditions.

To minimize the likelihood of incidental take and help enhance the likelihood that the dispersal of nēnē and koloa to the enrolled lands will result in an increased number of koloa and nēnē utilizing the UMIKOA RANCH agrees to the following conditions:

- Disallowing hunting on the upper portion of UMIKOA RANCH property (see Appendix A, Figure 2)
- Reporting to USFWS and DLNR of any incidental taking, including injury or killing of koloa and any incidental “death” of a fertile egg. Such reports of incidental injury or death will be thoroughly reviewed by USFWS and DLNR and procedures suggested to UMIKOA RANCH to avoid future incidental injuries or deaths.
- When situations arise that pose a threat of adverse impacts to koloa or nēnē, and UMIKOA RANCH, DLNR, or USFWS have actual knowledge of such situations, the Parties shall confer within 10 working days for the purpose of developing measures to address such situations.

UMIKOA RANCH shall not be held responsible for any death or injury of koloa or nēnē resulting from a *force majeure* event. The term *force majeure* means events that are beyond the reasonable control of, and did not occur through the fault or negligence of, UMIKOA RANCH, including but not limited to: “acts of God” or sudden actions of the elements, including wild fire, excessive rainfall, and drought. Should a *force majeure* event occur that results in injury or death of koloa and nēnē on enrolled lands, UMIKOA RANCH should simply report such an event to the USFWS and DLNR within 10 days of the occurrence.

## **10. FUNDING**

Funding for the construction of new wetlands, associated upland habitat, and fencing of newly created wetlands will be provided by UMIKOA RANCH with assistance from NRCS Wetland Reserve Program cost-share funding. Funding for koa reforestation, fencing of reforestation units, and controlled grazing within these fenced units will be provided by UMIKOA RANCH through a cost-share program as part of UMIKOA RANCH’s Forest Stewardship Project agreement with the State of Hawaii. Funding for predator control activities will be provided by UMIKOA RANCH. UMIKOA RANCH shall not be responsible for costs of additional predator control or habitat restoration efforts should they be required.

## **11. RESPONSIBILITIES OF THE PARTIES**

### **11.1 UMIKOA RANCH Responsibilities:**



- 1) Complete construction of approximately two acres of palustrine emergent marsh and 150 acres of riparian and associated uplands for nēnē and koloa;
- 2) Maintain fences that exclude cattle from new wetland habitat mentioned above and allow for controlled grazing within fenced areas;
- 3) Implement a control program for the control of rats, cats, mongooses, dogs, and pigs in areas likely to be utilized by the koloa and nēnē in and around new wetland habitats;
- 4) Prevent establishment of problematic alien invasive plant species in and around new wetland habitats;
- 5) Disallow recreational hunting on the upper portion of UMIKOA RANCH;
- 6) Prevent the introduction and establishment of non-native waterfowl and assist with the removal of non-native waterfowl;
- 7) Report to the USFWS and DLNR within 10 days of the occurrence any incidental taking, including injury or mortality of koloa and nēnē ;
- 8) Prepare annual reports on implementation of management actions of the Agreement in accordance with monitoring requirements (as described in section 12.0 of this Agreement);
- 9) Conduct biological monitoring (as described in section 12.0 of this Agreement) with the assistance of Ducks Unlimited;
- 10) Provide the USFWS and DLNR access to all lands under UMIKOA RANCH ownership for purposes of carrying out monitoring and management of koloa and nēnē;
- 11) Assist the USFWS and DLNR in responding to reports of koloa or nēnē from neighboring landowners, or cases requiring koloa or nēnē rescue; and
- 12) Notify DLNR and USFWS 30 days in advance of any planned land use practice (e.g. controlled burn, fencing, construction, tree harvesting, ground scarification, etc.) which UMIKOA RANCH reasonably anticipates may result in the incidental take of koloa or nēnē on the enrolled lands; and provide DLNR and USFWS with the opportunity to capture and/or relocate any potentially affected koloa or nēnē.

#### **11.2** *USFWS Responsibilities:*

- 1) Provide technical assistance when requested;
- 2) Assist UMIKOA RANCH in surveying forest birds, plants, and invertebrates on the enrolled lands;
- 3) Assist UMIKOA RANCH and DLNR in responding to reports of koloa or nēnē from neighboring landowners or cases requiring koloa or nēnē rescue;
- 4) Pursue funds for habitat restoration and management consistent with this Agreement;
- 5) Assist in providing access to Hakalau Forest National Wildlife Refuge for purposes of monitoring and managing koloa and nēnē;
- 6) Ensure that UMIKOA RANCH is implementing the provisions of this Agreement;
- 7) Perform biological monitoring with technical assistance of Ducks Unlimited;
- 8) Issue a permit to UMIKOA RANCH, upon execution of this Agreement and satisfaction of all other legal requirements, under section 10(a)(1)(A) of the ESA, in accordance with 50 CFR 17.22 (c), with a term of 99 years that would provide UMIKOA RANCH with authorization for incidental take of koloa and nēnē as a result of normal ranch activities on the enrolled lands; and

- 9) Provide assurances to UMIKOA RANCH, in accordance with 50 CFR 17.22(c)(5), that if additional conservation or mitigation measures are deemed necessary, no commitment of additional land, water, or other natural resources above and beyond the amount of baseline conditions would be required, without the consent of UMIKOA RANCH.

### **11.3** *DLNR Responsibilities:*

- 1) Provide technical assistance when requested;
- 2) Assist UMIKOA RANCH with identification and removal of feral waterfowl, as resources permit;
- 3) Pursue funds for habitat restoration and management consistent with this Agreement;
- 4) Upon appropriate notification, provide access to adjacent State lands for purposes of monitoring and managing the koloa and nēnē;
- 4) Work with UMIKOA RANCH and USFWS in responding to reports of koloa or nēnē from neighboring landowners, or cases requiring koloa or nēnē rescue; and
- 5) Upon execution of this Agreement and satisfaction of all other legal requirements, DLNR will issue a permit to UMIKOA RANCH, under HRS 195D-22(d), that runs with the land, that would provide UMIKOA RANCH with authorization for incidental take of koloa and nēnē as a result of normal ranch activities on the enrolled lands.

## **12. REPORTING AND MONITORING**

### **12.1** *Compliance Reporting and Monitoring*

UMIKOA RANCH will be responsible for annual monitoring and reporting related to the implementation or compliance of the Agreement. Information in annual reports will include koloa and nēnē habitat management activities and a description of habitat conditions. Reports will cover the activities in the months from July 1 to June 30 of each year, and will be submitted to USFWS and DLNR on October 1 of each year and will be made available to all Parties to this Agreement.

### **12.2** *Biological Reporting and Monitoring*

Upon completion of construction of the new wetland habitat, Ducks Unlimited Inc., working in cooperation with NRCS, will conduct monthly surveys of UMIKOA RANCH to determine the population status of koloa and nēnē and to monitor the newly restored WRP ponds for a period of one year. Additional biological information gathered will include: (1) effectiveness of koloa and nēnē habitat management activities at meeting the intended conservation benefits; (2) summary of nēnē and koloa population surveys; (3) recommendations for adaptive management; and (4) other information that may assist in the future recovery activities for nēnē and koloa. After the first year, the biological monitoring will be conducted annually by the USFWS with technical assistance provided by Ducks Unlimited.

### **13. CONTINGENCIES/ADAPTIVE MANAGEMENT**

The possibility exists that other listed, proposed, candidate species, or species of concern associated with native forest areas may occur on lands enrolled in this Agreement. If biological surveys determine this Agreement will provide a net conservation benefit to any such species or potential habitat for such species, the Parties may agree to amend this Agreement and enhancement of survival permits to cover such species.

### **14. DURATION OF RIGHTS AND OBLIGATIONS**

The rights and obligations under this Agreement shall run with the ownership of UMIKOA RANCH premises and are transferable to subsequent property owners in accordance with 50 CFR 13.25 and HRS §195D-22(d). The obligations under this Agreement will apply for 20 years from the date of approval and signing of this Agreement. The rights under this Agreement to enhancement of survival permits will hold for the duration of the Federal section 10(a)(1)(A) permit and State incidental take permit issued by the USFWS and DLNR respectively, and shall survive the expiration, suspension, rescission or sooner termination of this Agreement.

In the event that UMIKOA RANCH decides to transfer ownership of the enrolled lands to another party(ies), UMIKOA RANCH will notify the USFWS and DLNR at least 30 days prior to the intended ownership transfer to allow the agencies the opportunity to contact the intended new property owner(s) to explain the Safe Harbor Agreement and to determine whether the new property owner(s) agrees to continue the original Agreement. If the new property owner(s) desires to become a party to the original Agreement and enhancement of survival permits, the USFWS and DLNR will regard the new property owner(s) as having the same rights and obligations with respect to the enrolled property. Actions taken by the new property owner(s) that result in incidental take of species covered by the Agreement would be authorized, so long as the new property owner complies with the management actions identified in the Agreement and maintains baseline conditions. If the new property owner does not wish to continue the existing Agreement or to comply with the terms and conditions of the enhancement of survival permit, then the new property owner will be responsible for maintaining baseline conditions at the time the property was transferred.

### **15. MODIFICATION/TERMINATION**

This Agreement may be modified at any time by written mutual agreement of all parties. If, due to unanticipated circumstances, any party to this Agreement needs to terminate the Agreement prior to its expiration, the Party may do so by providing one hundred and eighty (180) days written notice to the other Parties, provided that the baseline conditions are not eroded and that DLNR or the USFWS is provided an opportunity to translocate affected nēnē and koloa within one hundred and eighty (180) days of such notice. The USFWS and DLNR shall also take reasonable efforts to capture and translocate any nēnē and koloa that remain on UMIKOA RANCH if requested to do so by UMIKOA RANCH.

## **16. ADDITIONAL MEASURES**

### **16.1 *Permit Suspension or Revocation***

The USFWS or DLNR may suspend or revoke the permit for cause in accordance with the laws and regulations in force at the time of such suspension or revocation.

### **16.2 *Remedies***

Each party shall have all remedies otherwise available to enforce the terms of this Agreement and the permit, except that no party shall be liable in damages for any breach of this Agreement, any performance or failure to perform an obligation under this Agreement or any other cause of action arising from this Agreement.

### **16.3 *Dispute Resolution***

The parties agree to work together in good faith to resolve any disputes, using dispute resolution procedures agreed upon by all parties.

### **16.4 *Availability of Funds***

Implementation of this Agreement is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation or expenditure of any money from the U.S. Treasury. The parties acknowledge that the USFWS will not be required under this Agreement to expend any federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit such expenditures as evidenced in writing.

### **16.5 *No Third-party Beneficiaries***

This Agreement does not create any new right or interest in any member of the public as a third party beneficiary, nor shall it authorize anyone not a party to this Agreement to maintain a suit for personal injuries or damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the parties to this Agreement with respect to the third parties shall remain as imposed under existing law.

### **16.6 *Relationship to Authorities***

The terms of this Agreement shall be governed by and construed in accordance with applicable federal and state laws. Nothing in this Agreement is intended to limit the authority of the USFWS or DLNR to fulfill their responsibilities under federal and state laws. All activities undertaken pursuant to this Agreement of the permit must be in compliance with all applicable state and federal laws and regulations.

### **16.7 *Succession and Transfer***

This Agreement shall be binding on and shall inure to the benefit of the parties and their respective successors and transferees, in accordance with applicable regulations (currently codified at 50 CFR 13.24 and 13.25).

**16.8** *Notices and Reports*

Any notices or reports required by this agreement shall be delivered in writing to the persons below:

Paul Conry  
Hawaii Division of Forestry and Wildlife  
1151 Punchbowl St.  
Honolulu, HI 96813

Paul Henson  
Field Supervisor, Ecological Services  
U.S. Fish and Wildlife Service  
300 Ala Moana Blvd., Room 3-122  
Honolulu, HI 96850

IN WITNESS WHEREOF, each party hereto has caused this Agreement to be executed by an authorized official on the day and year set forth opposite their signature.

UMIKOA RANCH

By: \_\_\_\_\_

Date: \_\_\_\_\_

U.S. FISH & WILDLIFE SERVICE

By: \_\_\_\_\_  
Rowan W. Gould, Deputy Regional  
Director, Portland, Oregon

Date: \_\_\_\_\_

HAWAI'I DEPARTMENT OF LAND &  
NATURAL RESOURCES

By: \_\_\_\_\_  
Gilbert Coloma-Agaran, Chairperson  
Board of Land & Natural Resources

Date: \_\_\_\_\_

APPROVED AS TO FORM

\_\_\_\_\_  
Deputy Attorney General  
State of Hawaii

## References Cited

- Giffin, J.G. 1983. (1) Abundance and distribution of koloa on the Island of Hawaii. (2) Movements, survival, reproductive success and habitat of koloa on the Island of Hawaii. Final Report. Pittman-Robertson Project Nos. W-18-R-7 and W-18-R-8, Job No. R-III-H. Hawaii Division of Fish and Game. 21 pp.
- Juvik, S.P. and J.O. Juvik. 1998. Atlas of Hawaii, 3<sup>rd</sup> ed. Department of Geography, University of Hawaii at Hilo. Honolulu: University of Hawaii Press. 333 pp.
- Olson, S.L. and H.F. James. 1991. Descriptions of thirty-two new species of birds from the Hawaiian islands: Part I. Non-passeriformes. Ornith. Monogr. 45:1-88.
- Olson, S.L. and H.F. James. 1992. Fossil birds from the Hawaiian Islands: evidence for wholesale extinction by man before western contact. Science 217:633-635.
- Schwartz, C.W. and E.R. Schwartz. 1949. The game birds in Hawaii. Board of Agriculture and Forestry. Territory of Hawaii. Hilo, HI: Hawaii News Printshop. 168 pp.
- Smith, J.D. 1952. The Hawaiian goose (nēnē) restoration program. J. Wildlife Mgmt. 16:1-19.
- U.S. Fish and Wildlife Service. 1982. Laysan Duck Recovery Plan. U.S. Fish and Wildlife Service, Portland OR. 37 pp.
- U.S. Fish and Wildlife Service. 1999a. Draft Revised Recovery Plan for the Hawaiian Waterbirds, 2nd Rev. U.S. Fish and Wildlife Service, Portland, OR. 107 pp.
- U.S. Fish and Wildlife Service. 1999b. Revised Recovery Plan for Nēnē or Hawaiian Goose (*Branta sandvicensis*). U.S. Fish and Wildlife Service, Portland, OR. 60 pp.

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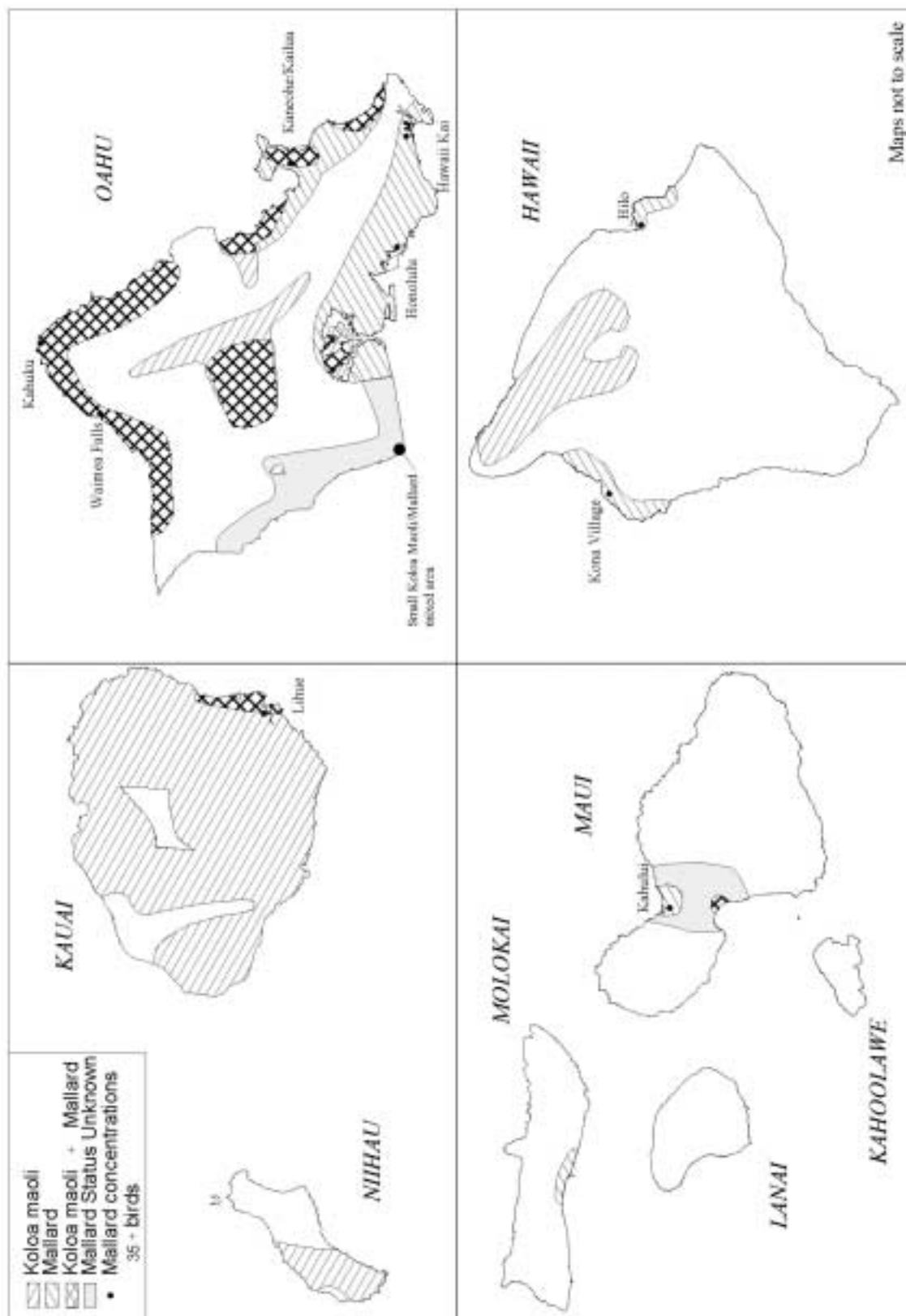
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APPENDIX A.  
Figures



Maps not to scale

Figure 1. Known distribution of koloa and mallards in the Hawaiian Islands (USFWS 1999a).

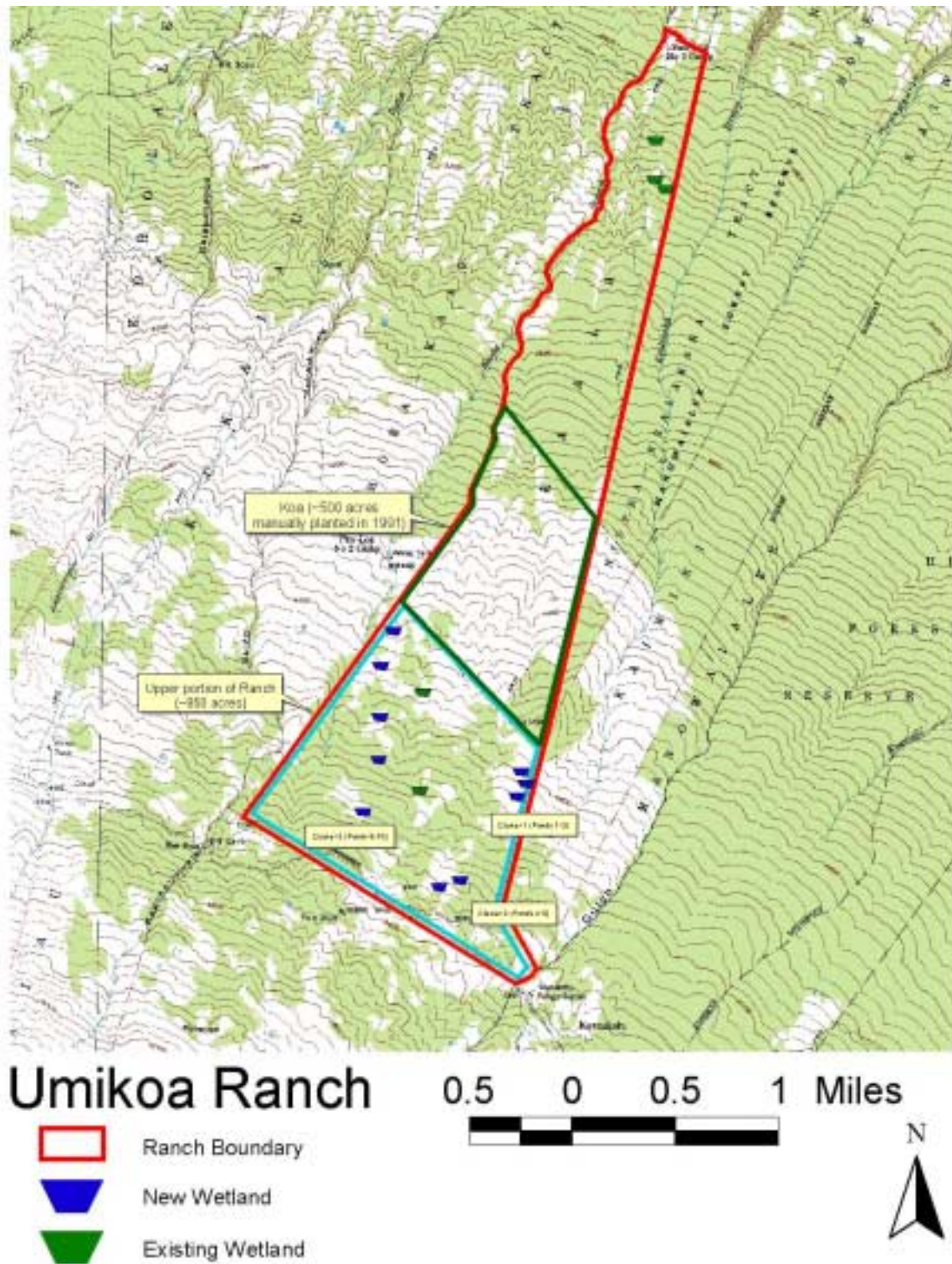


Figure 2A. Map of Umikoa Ranch showing: 1) Ranch boundary, 2) Koa forest (planted manually in 1991), 3) Upper portion of Ranch, 4) Location of new wetlands, and 5) Location of existing wetlands.



Figure 2B. Aerial photos of Umikoa Ranch showing reforestation efforts. [Note: In lower photo, extension of forest from T-shaped (*Eucalyptus*) stand is koa (*Acacia koa*) manually planted in 1991.]



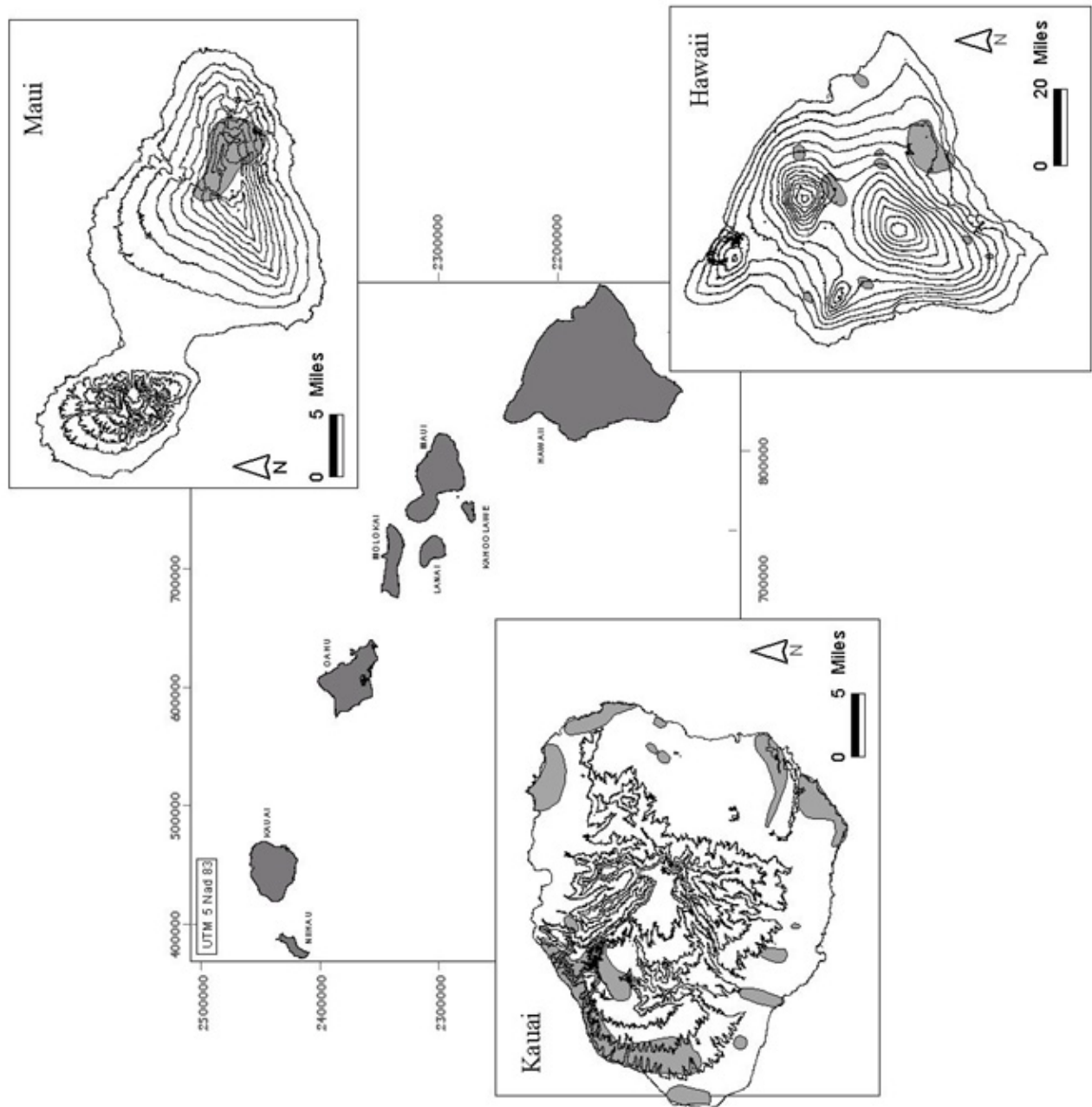


Figure 3. Known distribution of nēnē in the Hawaiian Islands (USFWS 1999b).

## APPENDIX B.

### Koloa Species Account

The koloa is a small dabbling duck that is considered to be a recent colonist to the Hawaiian Islands (R. Fleisher, pers. comm. 1993). Genetic studies indicate that the koloa are distinct at the species level (AOU 1998), and descended from the North American mallard complex (Livezey 1991, Browne et al. 1993, Cooper et al. 1996). Both sexes of koloa resemble a mallard (*Anas platyrhynchos*) hen but are generally smaller, deeper brown in color, more agile, and more covert.

Habitat loss is a limiting factor in the recovery of koloa (Banko 1987). Within the past two centuries, Hawaiian coastal wetlands have been reduced by 31% (Dahl 1990). In the early 1900's, koloa were common in the coastal marshes of all the main islands, except the dry islands (Munro 1960). By the mid-1900s, the species had been reduced to 500 individuals on Kauai and 30 on Oahu (Schwartz and Schwartz 1949). By 1960, the koloa on Oahu were extirpated when wetland habitat in Kaelepulu Pond was modified as part of a housing development (USFWS 1999a).

Between 1958 and 1989, the captive propagation and release of 757 pen-reared koloa was undertaken to reestablish the species in its former range. Today the state population is estimated to be 2,500 birds (USFWS 1999a). (Appendix A, Figure 1. Koloa Distribution Map). However, in addition to habitat loss, the koloa is confronted with the threats of introduced predators and hybridization with mallards (Swedberg 1967, Engilis and Pratt 1993, USFWS 1999a). Populations of koloa that have not interbred with mallards live only on Kauai, Niihau, and the Big Island (Griffin and Browne 1990, Engilis and Pratt 1993).

The koloa was listed as a Federal endangered species in 1967 (32 FR 4001). The long-term protection and management of habitats not currently secured is critical to the recovery of the koloa (USFWS 1999a). The koloa recovery goals for downlisting presented in the *Draft Revised Recovery Plan for Hawaiian Waterbirds* (USFWS 1999a) include removal of the threat of hybridization with mallards, multiple viable breeding populations on Kauai/Niihau, Oahu, and the Big Island, a stable or increasing statewide populations above 2,000 individuals for five years, and protection and management of primary wetland habitats such as montane stock ponds on private lands. The restoration, creation, and management of palustrine emergent wetlands, both permanent and seasonal, will increase koloa habitat within the existing landscape of stock ponds.

#### ***Habitat Types***

As is typical of island waterfowl, koloa exploit a wide range of geographically distinct habitat patches such as coastal marshes, lowland agricultural fields, stream plunge pools, ephemerally flooded pasture, stock ponds, and montane bogs ranging from sea level to 9,900 feet elevation. Agricultural wetlands supplement natural habitats and provide important foraging, mating, and brood-rearing areas (USFWS 1999a). Little is known about the habitat requirements required to

meet annual life cycle needs (such as pair bonding, nesting, brood rearing, molting), or other environmental factors limiting recovery.

On the Big Island, the highest number of koloa is found in the mid- to upper-elevation stock ponds and streams of the Kohala-Mauna Kea Region (Kosaka 1973). An estimated 200 koloa are distributed from sea level to 6,400 feet elevation from Hawi to Puu 'O'o in the north windward areas (Giffin 1983, Engilis and Pratt 1993). The captive bred koloa dispersed up to 25 miles from release sites and were observed in seeps, stock watering ponds, small reservoirs, ditches, and streams of the Kohala-Mauna Kea Region. The pen-reared birds were found to be surviving and reproducing in the Kohala ponds at rates higher than other sites (Kosaka 1973). (Appendix A, Figure 1. Koloa Historical and Current Distribution)

Big Island mountain streams favorable to koloa are characterized as 500-4000 feet in elevation, approximately 23 feet wide, banks 2-75 feet high and heavily vegetated, water clear, shallow and swift flowing, rocky bed with many potholes, and minimal disturbance (Paton 1981, Giffin 1983). In the stock ponds, Giffin (1983) found koloa activity to be highest in complexes of small, clustered ponds located near a perennial stream. Today the Kohala-Mauna Kea ponds continue to provide important habitat, especially those isolated from human activity, with open water and exposed mudflats (J. Giffin, Hawai'i DOFAW, pers. comm. 1999). Giffin (1983) recommended the modification and construction of reservoirs and stock ponds for the benefit of waterfowl.

### ***Koloa Breeding Habitat***

Koloa breed year round with nesting activity peaking from January to May. Koloa nests and broods have been observed in all habitat types. Nests are typically hidden in dense herbaceous vegetation and located close to water. However, koloa have been documented nesting in pasture approximately one mile from the nearest water body (T. Lum, Hawai'i DOFAW, pers. comm. 1994). The value of stock ponds for waterfowl production is well documented in North America (Payne 1992). On the Big Island, nests have been reported by ranchers on grassy slopes or ridges adjacent to stock ponds (Giffin 1983). Regular sightings of koloa broods in the Big Island ranch ponds also indicate favorable conditions for brood rearing.

### ***Diet and Foraging Habitat***

Dabbling ducks are opportunistic feeders foraging primarily on aquatic plants and invertebrates. Foods vary considerably depending on habitat and season. Lack (1970) found that island ducks have a wider range of foods throughout the year, than their mainland counterparts. Koloa have been documented foraging on a variety of aquatic insects, mollusks, crustaceans, and tadpoles. Aquatic plant foods include the seeds of grasses, sedges, and rushes (e.g., *Paspalum*, *Echinochloa*, *Scheonoplectus*, *Eleocharis*) and the seeds and leaves of various hydrophytes (e.g., *Polygonum*, *Ruppia*, *Potamogeton*). Foraging usually occurs in water less than six inches deep. Food preferences appear to be based on site suitability and not specialized needs (Swedberg 1967, Telfer 1976).

## References Cited

- American Ornithologists' Union. 1998. Checklist of North American Birds, 7th ed. Lawrence, Kansas: Allen Press. 829 pp.
- Banko, W.E. 1987. Population histories--species accounts, freshwater birds: koloa-maoli. Cooperative National Park Resources Studies Unit, University of Hawaii, Honolulu. 165 pp.
- Browne, R.A., Griffin, C.R., Chang, P.R., Hubley, M. and A.E. Martin. 1993. Genetic divergence among populations of the Hawaiian duck, Laysan duck, and mallard. *The Auk* 110(1):49-56.
- Cooper, A., J. Rhymer, H.F. James, S.L. Olson, C.E. McIntosh, M.D. Sorenson, and R.C. Fleisher. 1996. Ancient DNA and island endemics. *Nature* 381:484.
- Dahl, T.E. 1990. Wetlands Losses in the United States 1780's to 1980's. Washington D.C.: U.S. Department of the Interior, U.S. Fish and Wildlife Service. 21 pp.
- Engilis, A., Jr. and Pratt, T.K. 1993. Status and population trends of Hawaii's native waterbirds, 1977-1987. *Wilson Bulletin* 105(1):142-158.
- Giffin, J.G. 1983. (1) Abundance and distribution of koloa on the Island of Hawaii. (2) Movements, survival, reproductive success and habitat of koloa on the Island of Hawaii. Final Report. Pittman-Robertson Project Nos. W-18-R-7 and W-18-R-8, Job No. R-III-H. Hawaii Division of Fish and Game. 21 pp.
- Griffin, C.R. and R. Browne. 1990. Genetic variation and hybridization in Hawaiian duck and mallards in Hawaii. Unpubl. Report. U.S. Fish and Wildlife Service, Hawaiian and Pacific Island National Wildlife Refuge Complex. 22 pp.
- Kosaka, E. 1973. Limited surveys of dispersal and survival of koloa released on the Island of Hawaii. Pittman-Robertson Project No. W-15-2, Job No. VIII-A(2). Hawaii Division of Fish and Game. 3 pp.
- Lack, D. 1970. The endemic ducks of remote islands. *Wildfowl*. 21:5-10.
- Livezey, B.C. 1991. A phylogenetic analysis and classification of recent dabbling ducks (tribe Anatini) based on comparative morphology. *The Auk* 108:471-507.
- Munro, G.C. 1960. Birds of Hawaii. Vermont and Tokyo: Charles E. Tuttle Co. 189 pp.
- Paton, P.W.C. 1981. The koloa (Hawaiian duck) on the island of Hawaii. *Elepaio* 41(12):131-133.



- Payne, N.F. 1992. Techniques for Wildlife Habitat Management of Wetlands. New York: McGraw-Hill, Inc. 549 pp.
- Schwartz, C.W. and E.R. Schwartz. 1949. The game birds in Hawaii. Board of Agriculture and Forestry. Territory of Hawaii. Hilo, HI: Hawaii News Printshop. 168 pp.
- Swedberg, G.E. 1967. The Koloa. Federal Aid to Wildlife Restoration Act (W-5-R), Department of Land and Natural Resources, Honolulu. 56 pp.
- Telfer, T.C. 1976. Description of waterbird habitats as related to food availability and feeding behavior of endangered waterbird species on the islands of Kauai and Oahu. Job Progress Report. Pittman-Robertson Project No. W-18-R-1, Job No. R-III-D. Hawaii Division of Fish and Game. 18 pp.
- U.S. Fish and Wildlife Service. 1999a. Draft Revised Recovery Plan for the Hawaiian Waterbirds, 2nd Rev. U.S. Fish and Wildlife Service, Portland, OR. 107 pp.

## APPENDIX C.

### Nēnē Species Account

Of the six known endemic goose species that make up Hawai‘i’s historic avifauna, only the nēnē has survived (Olson and James 1991). The nēnē or Hawaiian goose is a medium-sized goose that is closely related to the Canada goose (*Branta canadensis*) (Quinn *et al.* 1991). The plumage of both sexes are similar. Juvenile nēnē resemble juvenile Canada geese until their first pre-basic molt (Hunter 1995).

Fossil evidence indicates that nēnē were once distributed throughout the Hawaiian Islands and occurred on all of the main Hawaiian Islands (Olson and James 1992). At the time of the arrival of Europeans in 1778, the nēnē distribution was limited to the island of Hawai‘i and its numbers were estimated to be less than 25,000 (Elder and Woodside 1958). The current decline of the species began in the early 1800s as birds were extirpated from lowland habitats (Baldwin 1945) and by 1952 the wild population was estimated to be 30 birds (Smith 1952). This decline is attributed to habitat loss, unregulated hunting, and predation from introduced mammals including rats, dogs, cats, mongooses and pigs.

The nēnē was listed as a Federally endangered species in 1967 (32 FR 4001) but efforts to conserve nēnē had already begun. In 1949 the State with the assistance from the U.S. Fish and Wildlife Service, initiated a captive breeding and release program. The Zoological Society of San Diego currently manages the nēnē captive propagation program at the Maui Bird Conservation Center and the Keauhou Bird Conservation Center. The current wild population is estimated to be between 900 and 1,000 (390 Kauai, 200-250 Maui and 375 Hawaii) (DOFAW 2000).

On the island of Hawai‘i nēnē have been established in several areas: Hawai‘i Volcanoes National Park/Keauhou/Kulani, Kahuku, Hakalau/Pu‘u ‘O‘o Ranch, Kipuka ‘Ainahou, Kapapala/Ka‘u Desert, Pu‘u Wa‘awa‘a/Pu‘u Lani. In addition, flocks are managed at Shipman and Kings Landing (USFWS 1999b) (see Appendix A, Figure 3. Nēnē Distribution Map).

#### ***Habitat Types***

Nēnē inhabit a variety of habitats from sea level to 8,000 feet. Habitat types occupied by nēnē include alpine scrublands, lava flows, cinder deserts, mid-elevation native and non-native shrub lands, grassy coastal dunes, golf courses, and grazed pastures (USFWS 1999b). The current distribution has been highly influenced by the location of release sites for captive-bred nēnē. Nēnē usually inhabit areas with less than 90 inches of annual rainfall (USFWS 1999b). The presence of open or flowing water is not necessary for successful breeding, but recent observations of the nēnē in lowland coastal areas indicate that open water, when available, will be readily utilized (USFWS 1999b). These open water areas in wetlands can provide protection from terrestrial predators such as rats and mongooses.

### ***Nēnē Breeding Habitat***

Nēnē has an extended breeding season. Although nesting most typically occurs between October and March, eggs have been laid from August to April (USFWS 1999b). The greatest number of first clutches are produced between October and December (Kear and Burger 1980). Nēnē nests are constructed on the ground and are typically a shallow scrape, lined with a variety of plant material and feather down, and are well hidden under a shrub or in a clump of grass.

Seasonal movement of nēnē upslope and down-slope has been suggested (USFWS 1999b). It is currently believed that nēnē breed and molt primarily in the lowlands (below 2,300 feet) and then move upslope (above 3,900 feet) in the hotter and drier months (Banko 1988, Henshaw 1902, Munro 1944, Perkins 1903).

### ***Diet and Foraging Habitat***

Nēnē are browsing grazers and feed on a variety of native and introduced plants. Thirty plant species have been identified as nēnē forage. These include native and non-native plants (Black *et al.* 1994). In 1947 Baldwin identified the native grass *Deschampsia nubigena* as the most abundant food item for nēnē. In a study of nēnē at Hawai‘i Volcanoes and Haleakala National Parks, Black *et al.* (1994) documented that a high proportion of nēnē diets consisted primarily of alien grasses such as mesquite grass (*Holcus lanatus*), rattail grass (*Sporobolus africanus*), kikuyu grass (*Pennisetum clandestinum*), broom sedge (*Andropogon virginicus*), gosmore (*Hypochoeris radicata*) and molasses grass (*Melinis minutiflora*). Although fruit of native shrubs such as pukiawe (*Styphelia tameiameia*) and ohelo (*Vaccinium reticulatum*) also occurred in abundance in nēnē diets, the increase in alien grasses in nēnē diets indicates the adaptability of nēnē to new food sources. Until recently adequate nutrition did not appear to be a limiting factor, but recent research indicates that inadequate nutrition for goslings may be a limiting factor in some areas (Baker and Baker 1995, Black and Banko 1994, Black *et al.* 1994). Nutrition does not appear to be a limiting factor on Kauai where nēnē occur mainly at low elevations. The favorable lowland plants used by nēnē on Kauai include sow thistle (*Sonchus oleaceus*), wire grass (*Eleusine indica*), crabgrass (*Digitaria adscendens*), Bermuda grass (*Cynodon dactylon*) and gosmore (T. Telfer, Kauai DOFAW, pers. comm. 1994).

## References Cited

- Baker, P.E. and H. Baker. 1995. Nēnē report: egg and gosling mortality in Haleakala National Park, 1994-95. Unpublished report to DOFAW. 45 pp.
- Baldwin, P.H. 1945. The Hawaiian goose, its distribution and reduction in numbers. *Condor* 47:27-37.
- Baldwin, P.H. 1947. Foods of the Hawaiian goose. *Condor* 49:108-120.
- Banko, P.C. 1988. Breeding biology and conservation of the nēnē, Hawaiian goose (*Nesochen sandvicensis*). Ph.D. diss., Univ. Washington, Seattle.
- Black, J.M. and P.C. Banko. 1994. Is the Hawaiian Goose (*Branta sandvicensis*) Saved from Extinction? Pp. 349-410 in *Creative conservation - interactive management of wild and captive animals* (eds. P.J.S. Olney, G.M. Mace and A.T.C. Feistner). London: Chapman and Hall.
- Black, J.M., J. Prop, J.M. Hunter, F. Woog, A.P. Marshall, and J.M. Bowler. 1994. Foraging behaviour and energetics of the Hawaiian goose *Branta sandvicensis*. *Wildfowl* 45:65-109.
- Elder, W.H. and D.H. Woodside. 1958. Biology and Management of the Hawaiian Goose. Pp. 198-215 in *Transactions of the Twenty-third North American Wildlife Conference*. Wildlife Management Institute, Washington, D.C.
- Henshaw, H.W. 1902. Birds of the Hawaiian Islands, being a complete list of the birds of the Hawaiian possessions, with notes on their habits. Honolulu: Thos. G. Thrum. 146 pp.
- Hunter, J.M. 1995. A key to ageing goslings of the Hawaiian goose *Branta sandvicensis*. *Wildfowl* 46:55-58.
- Kear, J. and A.J. Berger. 1980. The Hawaiian goose: an experiment in conservation. Calton, U.K.: T. A.D. Poyser.
- Munro, G.C. 1944. Birds of Hawaii. Honolulu: Tongg Publ. Co.
- Olson, S.L. and H.F. James. 1991. Descriptions of thirty-two new species of birds from the Hawaiian islands: Part I. Non-passeriformes. *Ornith. Monogr.* 45:1-88.
- Olson, S.L. and H.F. James. 1992. Fossil birds from the Hawaiian Islands: evidence for wholesale extinction by man before western contact. *Science* 217:633-635.
- Perkins, R.C.L. 1903. Vertebrata. Pp. 365-466 in *Fauna Hawaiiensis*, Vol. 1, Pt. 4 (ed. D. Sharp). Cambridge, England: The Univ. Press.

- Quinn, T. W., G.F. Shields, and A.C. Wilson. 1991. Affinities of the Hawaiian goose based on two types of mitochondrial DNA data. *Auk* 108: 585-593.
- Smith, J.D. 1952. The Hawaiian goose (nēnē) restoration program. *J. Wildlife Mgmt.* 16:1-19.
- U.S. Fish and Wildlife Service. 1967. Native Fish and Wildlife: Endangered Species. *Federal Register* 32(48):4001.
- U.S. Fish and Wildlife Service. 1999b. Revised Recovery Plan for Nēnē or Hawaiian Goose (*Branta sandvicensis*). U.S. Fish and Wildlife Service, Portland, OR. 60 pp.

APPENDIX D.

State of Hawaii Incidental Take Permit (to be developed by DOFAW)

APPENDIX E.

USFWS Section 10(a)(1)(A) Permit (to be developed by the USFWS)

## APPENDIX F.

### Guidelines for the Handling Injured Koloa/Nēnē and Koloa/Nēnē Carcasses

The purpose of these Guidelines is to provide Umikoa Ranch personnel with sufficient information to correctly determine the disposition of injured koloa or Nēnē carcasses that they encounter on lands owned or otherwise controlled by Umikoa Ranch, Limited.

#### Criteria for Handling Injured or Ill Birds

1. See if the bird can fly. If the bird can fly, do not remove from the field. Report incident to DOFAW personnel as soon as possible. Continue to monitor bird if possible. Record the following information:
  - Date
  - Location
  - Banded/Unbanded (If banded, record band number if possible.)
  - Condition of bird, e.g. type of injury
  - Additional comments
2. If an injured or ill bird cannot fly, do the following:
  - a. Notify Ronald Bachman or Joey Mello (Hawaii DOFAW) at 974-4221 as soon as possible.
  - b. Mark area and monitor if possible until State personnel arrive.
3. Injured koloa or nēnē may only be captured by personnel who have been trained in the capture and collection of live koloa or nēnē and after approval is received from DOFAW personnel.

#### Criteria for Collecting Koloa/Nēnē Carcasses

1. All koloa or nēnē carcasses will be collected for necropsy in order to determine cause of death, where possible, and to provide information about general movements.
2. If a bird is found dead and determined to be fresh (less than 48 hours), put bird in sealed plastic bag and place in refrigerator or on ice and contact Ronald Bachman or Joey Mello (Hawaii DOFAW) at 974-4221. If unable to contact these personnel within 48 hours, place the bird in a sealed plastic bag in a freezer. Birds will be collected by DOFAW personnel and submitted for necropsy.
3. If bird is obviously in a state of decay, place the bird in a sealed plastic bag in a freezer and notify DOFAW personnel as soon as possible. Birds will be collected by DOFAW personnel and submitted for necropsy.
4. Record the following information for both dead and injured birds:
  - Date
  - Location



- Banded/Unbanded (If banded, record band numbers.)
- Condition of bird
- Additional comments

## APPENDIX G.

Findings and determinations Supporting this Agreement (excerpts from or copies of HRS §195D-22(b) and federal 50 CFR 13 and 17 relating to SHA)

## APPENDIX H.

Related agreements (NRCS WRP agreemen)

